



Subject card

Subject name and code	Technical Processes of Renewable Energy, PG_00064336						
Field of study	Chemical Technology						
Date of commencement of studies	February 2027		Academic year of realisation of subject			2027/2028	
Education level	second-cycle studies		Subject group			Optional subject group Specialty subject group Subject group related to scientific research in the field of study	
Mode of study	Full-time studies		Mode of delivery			at the university	
Year of study	1		Language of instruction			Polish	
Semester of study	2		ECTS credits			3.0	
Learning profile	general academic profile		Assessment form			exam	
Conducting unit	Department of Corrosion and Electrochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Juliusz Orlikowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		5.0		40.0	75
Subject objectives	The aim of the course is to obtain knowledge about the technological processes of e-fuel production and other renewable energy installations.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W02] selects appropriate apparatus and materials for the manufacture and processing of consumer goods		knows the methods of producing renewable energy		[SW1] Assessment of factual knowledge		
	[K7_U03] designs innovative technological solutions for obtaining useful goods based on the state of the knowledge in accordance with the latest scientific literature		is able to use the equipment to perform a technological process in laboratory conditions.		[SU4] Assessment of ability to use methods and tools		
	[K7_K01] critically evaluates the content of cognitive and practical problems		is able to appropriately define priorities for the implementation of specific tasks.		[SK5] Assessment of ability to solve problems that arise in practice		
Subject contents	Course content – lecture						
	Technological processes for obtaining renewable energy will be presented, including the extraction of methane, hydrogen, syngas, and methanol. Information on the production of e-fuels will be presented. Design solutions and technological conditions for individual production stages will be discussed. Against this background, the mechanisms of high-temperature corrosion processes will be presented. Hydrogen degradation in such forms as hydrogen cracking, hydrogen embrittlement, creep, and high-temperature corrosion will be discussed in detail.						
	Course content – laboratory						
	Energy storage in the context of batteries, accumulators and fuel cells						
Prerequisites and co-requisites	Basic knowledge of chemical engineering and chemical equipment						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Exam		60.0%		50.0%		
	Laboratory		60.0%		50.0%		

Recommended reading	Basic literature	1. Prabir Basu, Biomass Gasification, Pyrolysis and Torrefaction, Elsevier, 2013 2. S. Wang, Z. Luo, Pyrolysis of Biomass, De Gruyter, 2016
	Supplementary literature	Not required
	eResources addresses	
Example issues/ example questions/ tasks being completed	Calculating the yield of the WGSR reaction Explaining the corrosion mechanisms occurring in the aqueous stream after the FT reactor Describe the reaction mechanisms occurring during FT synthesis	
Practical activities within the subject	Not applicable	

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